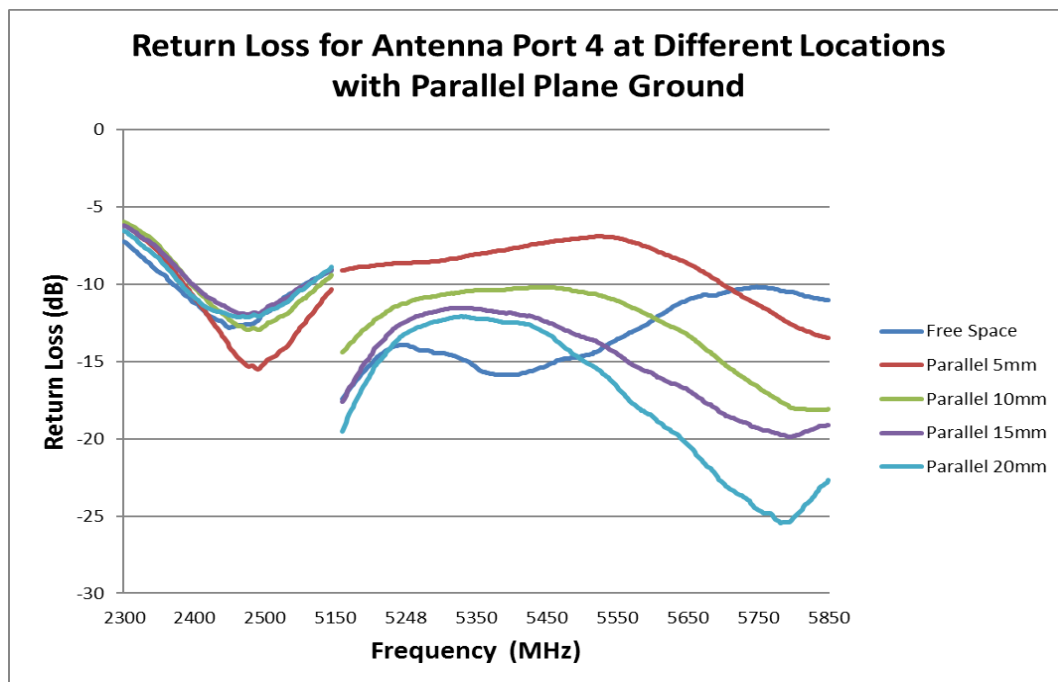
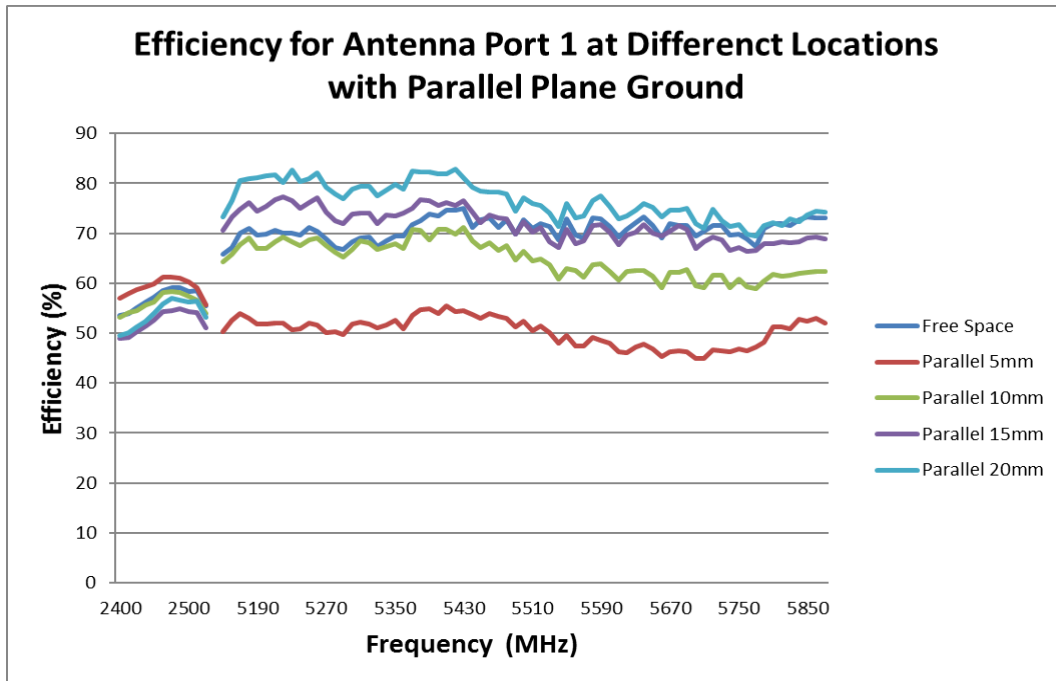


**FIGURE 6.1.3 RETURN LOSS OF ANTENNA PORT 3 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

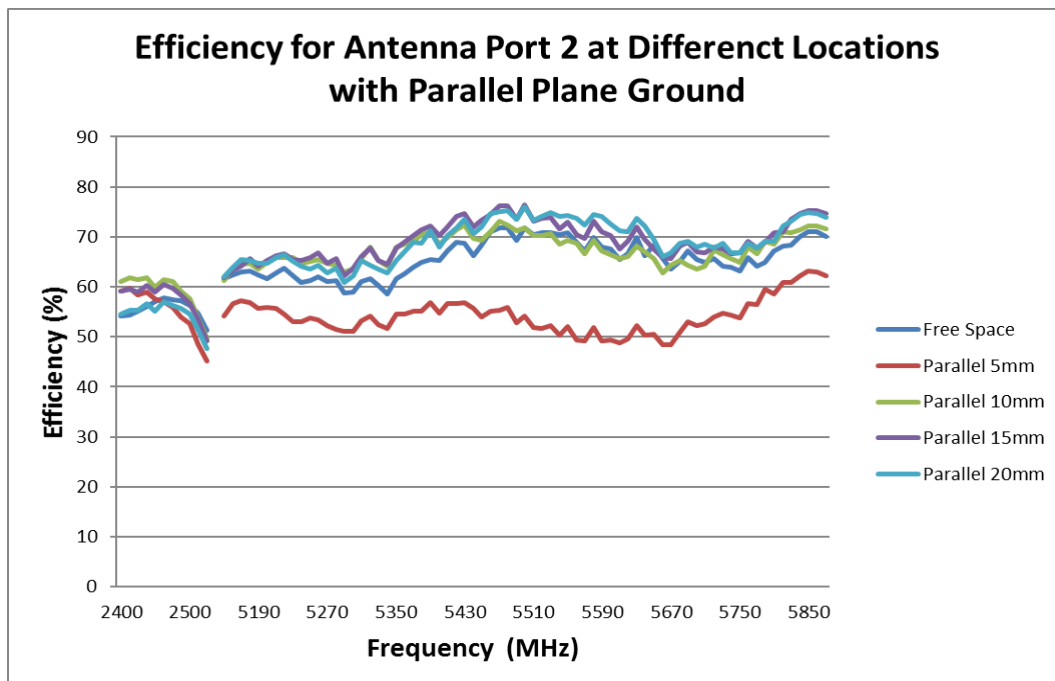


**FIGURE 6.1.4 RETURN LOSS OF ANTENNA PORT 4 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>47 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>AS-2123300100</b>	Liu Hai 2020/07/07	Kang Cheng 2020/07/07	Andy Zhang 2020/07/07

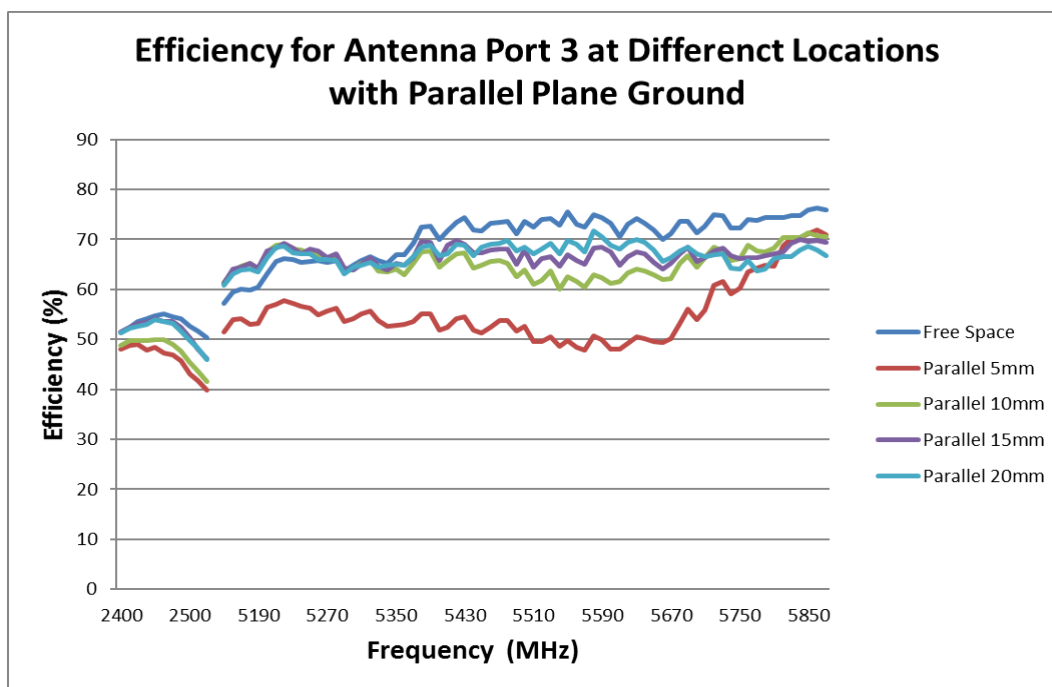


**FIGURE 6.1.5 EFFICIENCY OF ANTENNA PORT 1 AT FOUR LOCATIONS  
WITH PARALLEL PLANE GROUND**

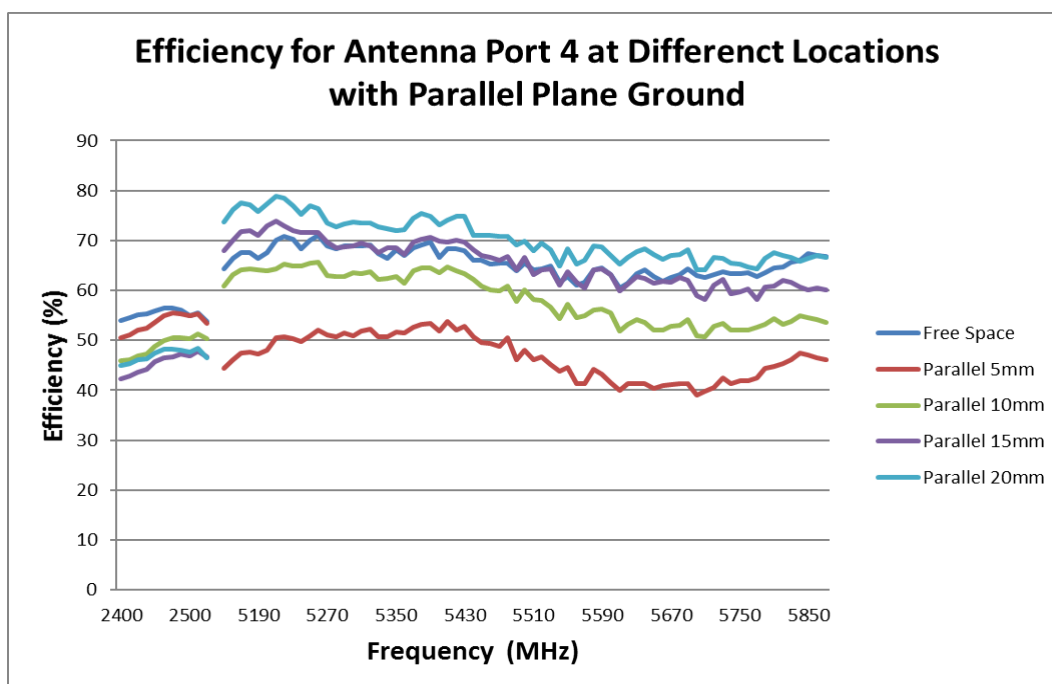


**FIGURE 6.1.6 EFFICIENCY OF ANTENNA PORT 2 AT FOUR LOCATIONS  
WITH PARALLEL PLANE GROUND**

REVISION: <b>B</b>	ECR/ECN INFORMATION: EC No: 642299 DATE: 2020/07/15	TITLE: <b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	SHEET No. <b>48 of 65</b>
DOCUMENT NUMBER: <b>AS-2123300100</b>	CREATED / REVISED BY: Liu Hai 2020/07/07	CHECKED BY: Kang Cheng 2020/07/07	APPROVED BY: Andy Zhang 2020/07/07



**FIGURE 6.1.7 EFFICIENCY OF ANTENNA PORT 3 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

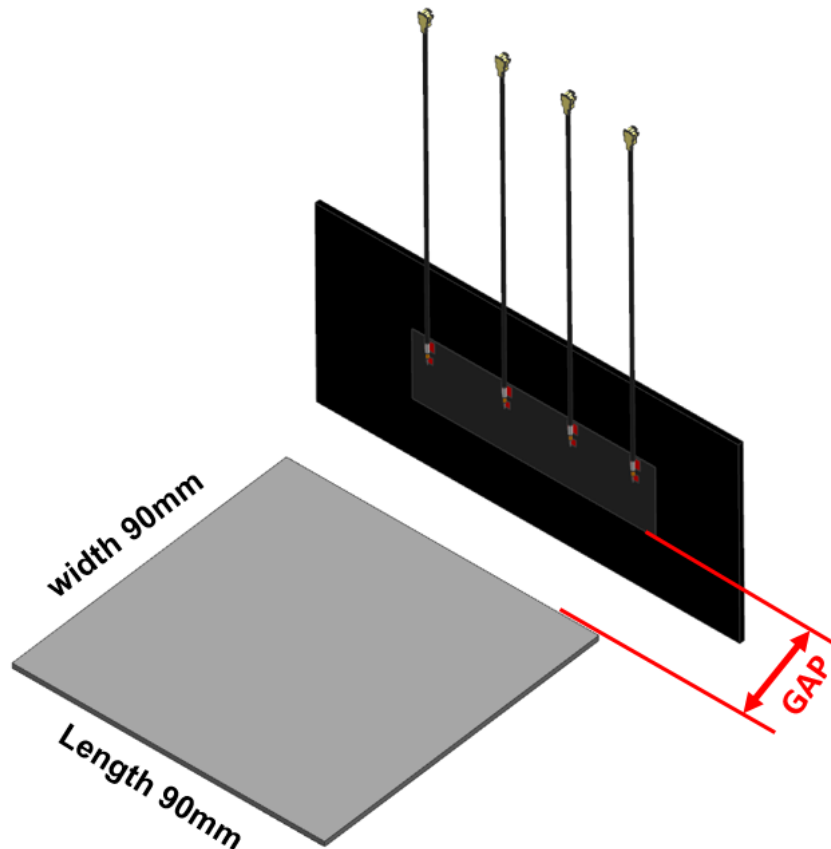


**FIGURE 6.1.8 EFFICIENCY OF ANTENNA PORT 4 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>49 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>AS-2123300100</b>	Liu Hai 2020/07/07	Kang Cheng 2020/07/07	Andy Zhang 2020/07/07

## 6.2 ANTENNA RF PERFORMANCE AS A FUNCTION OF DIFFERENT LOCATIONS WITH VERTICAL PLANE GROUND

Four locations with vertical plane ground have been evaluated and these locations are shown in figure 6.2.0. The plane ground size is 90mm\*90mm and we move the plane ground to four locations for each test. The distance between antenna and vertical plane ground affect the antenna performance slightly. We still suggest the minimum distance between antenna and plane ground is recommended to be 5mm.



**FIGURE 6.2.0 FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

Ground Size: 90mm\*90mm;

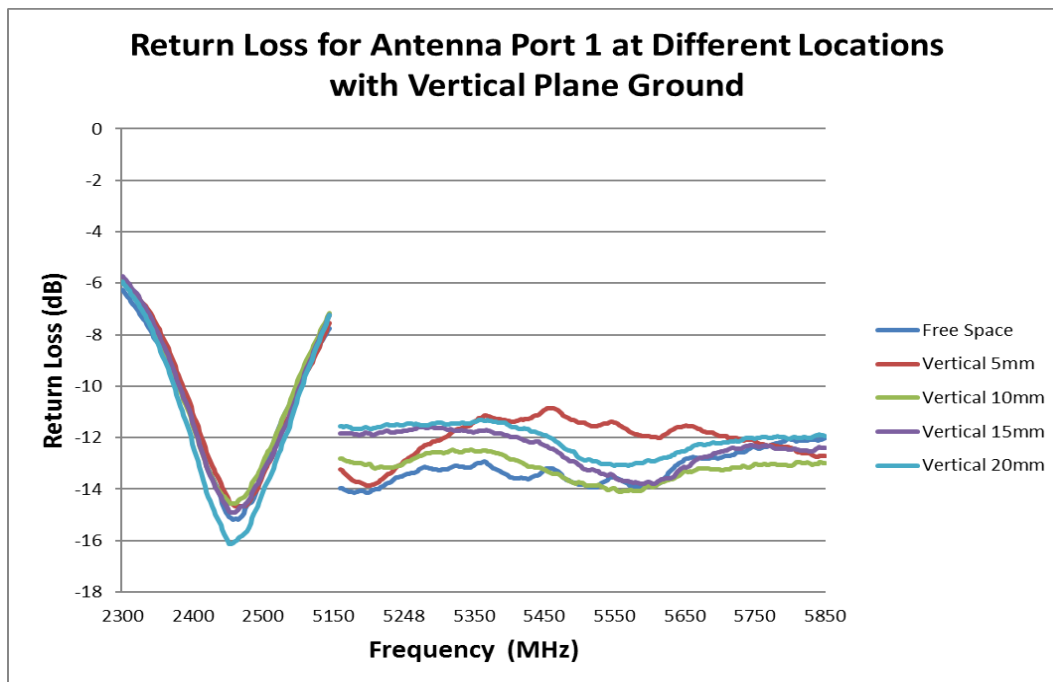
Location 1: Distance between antenna and plane (GAP) ground is about 5mm;

Location 2: Distance between antenna and plane (GAP) ground is about 10mm;

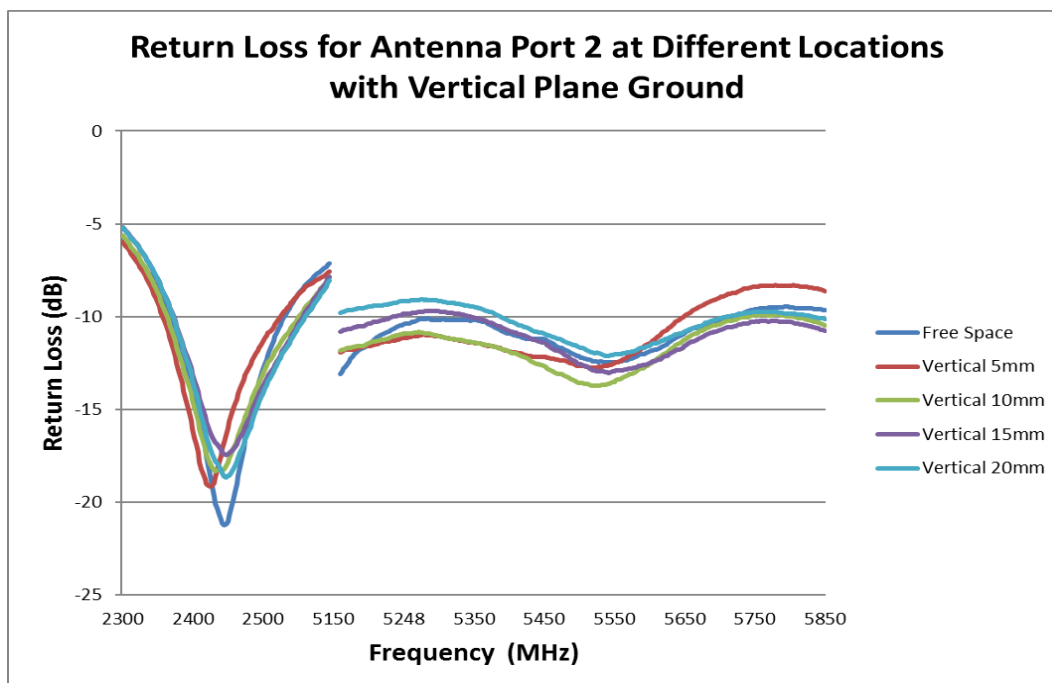
Location 3: Distance between antenna and plane (GAP) ground is about 15mm;

Location 4: Distance between antenna and plane (GAP) ground is about 20mm.

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DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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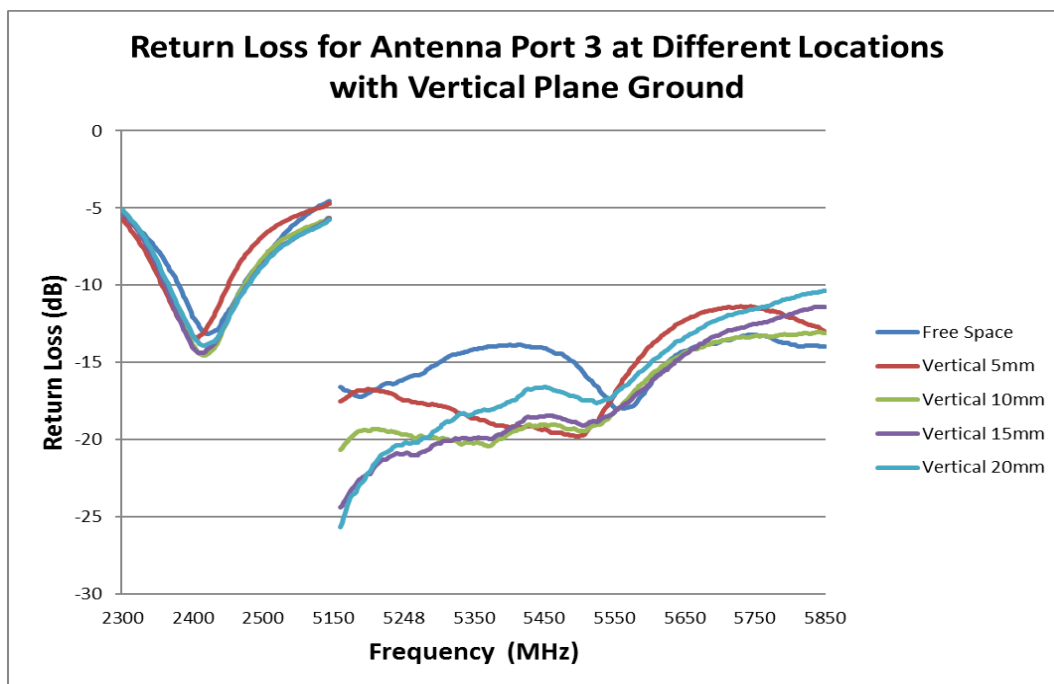


**FIGURE 6.2.1 RETURN LOSS OF ANTENNA PORT 1 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

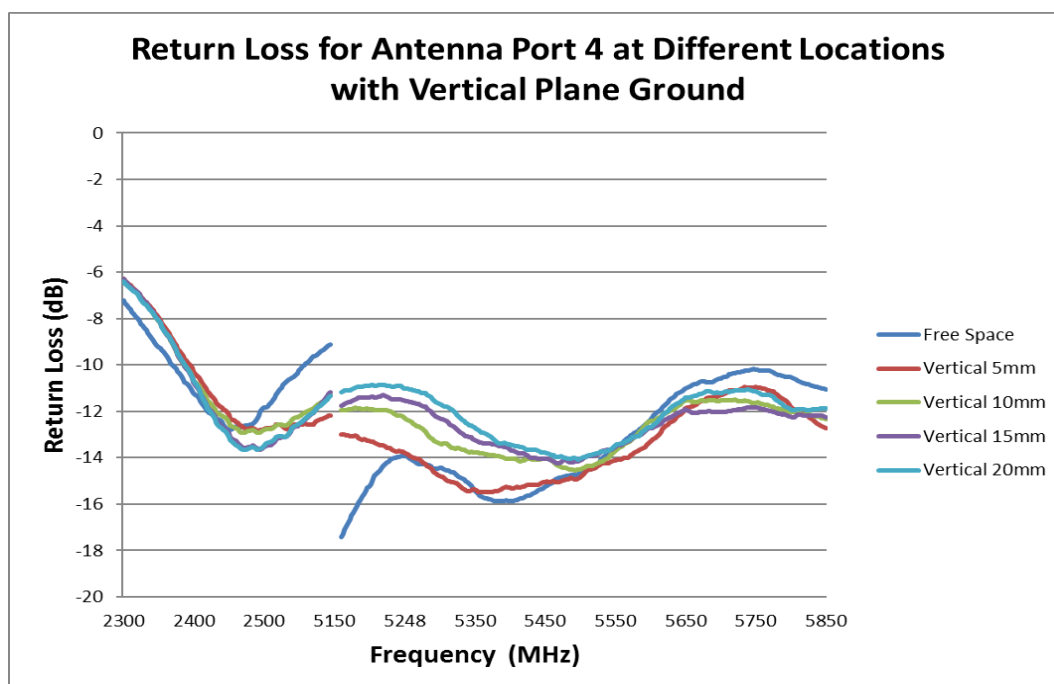


**FIGURE 6.2.2 RETURN LOSS OF ANTENNA PORT 2 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>51 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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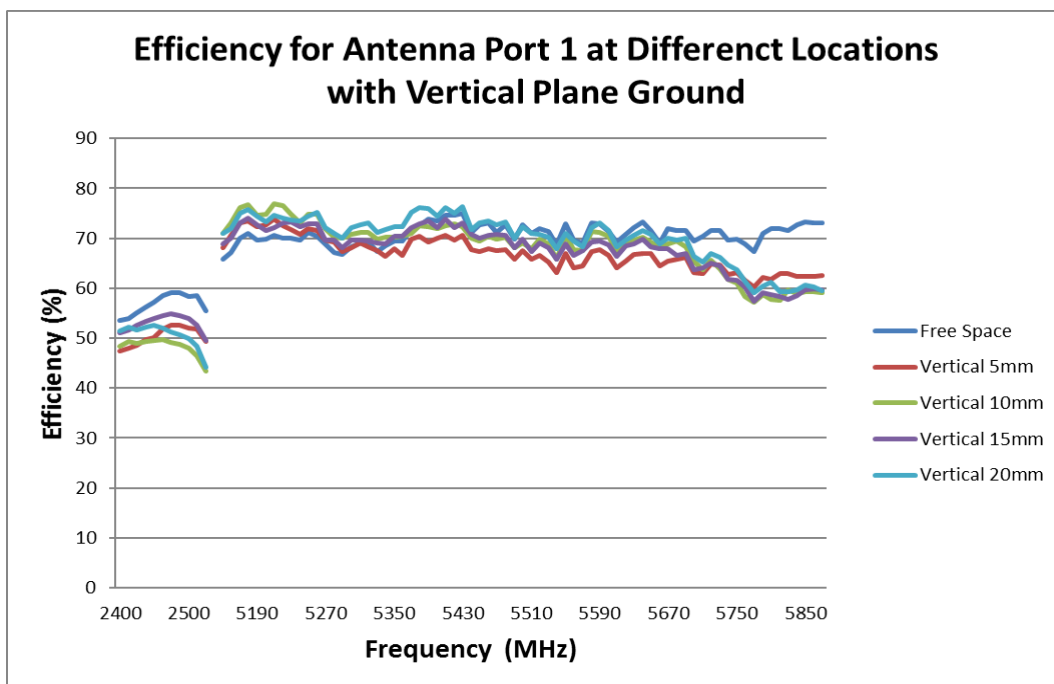


**FIGURE 6.2.3 RETURN LOSS OF ANTENNA PORT 3 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

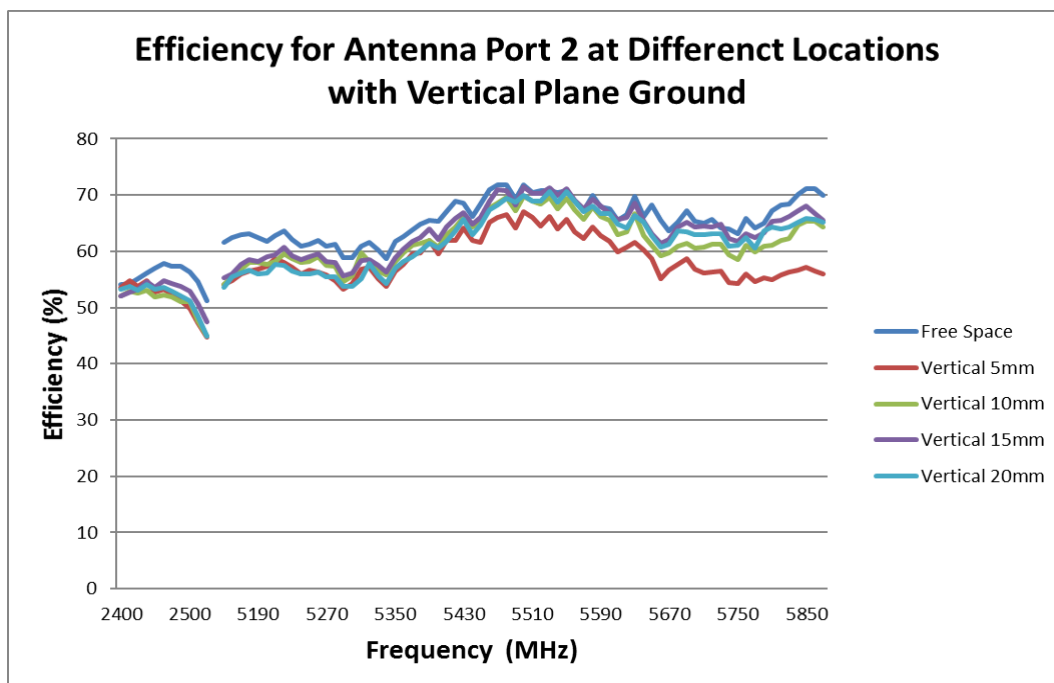


**FIGURE 6.2.4 RETURN LOSS OF ANTENNA PORT 4 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>52 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>AS-2123300100</b>	Liu Hai 2020/07/07	Kang Cheng 2020/07/07	Andy Zhang 2020/07/07

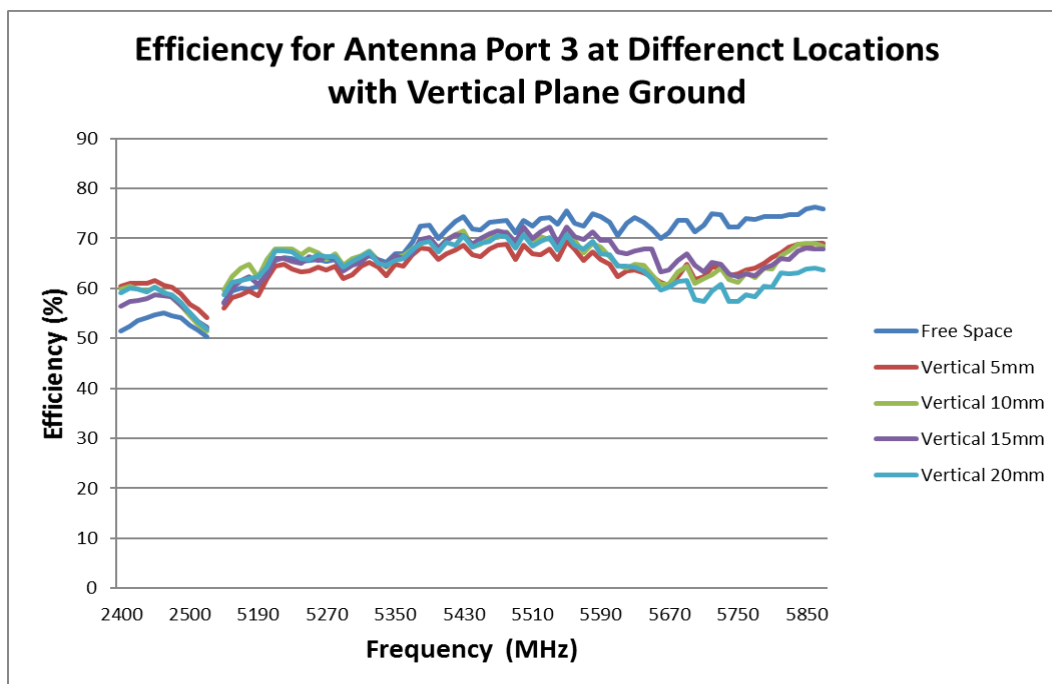


**FIGURE 6.2.5 EFFICIENCY OF ANTENNA PORT 1 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

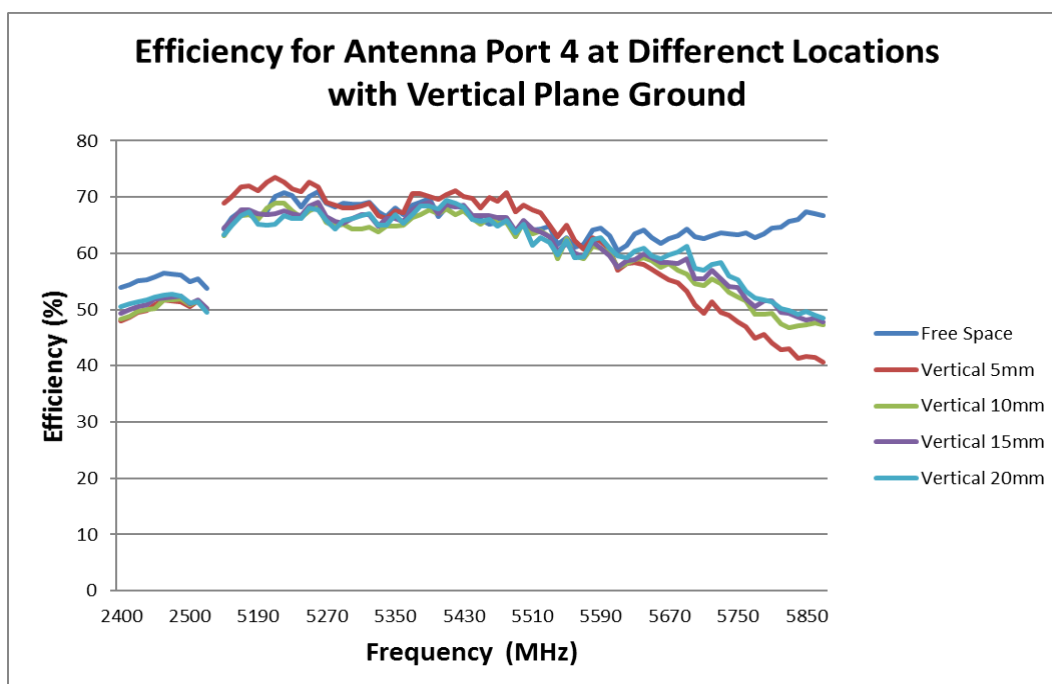


**FIGURE 6.2.6 EFFICIENCY OF ANTENNA PORT 2 AT FOUR LOCATIONS WITH VERTICAL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>53 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>AS-2123300100</b>	Liu Hai 2020/07/07	Kang Cheng 2020/07/07	Andy Zhang 2020/07/07



**FIGURE 6.2.7 EFFICIENCY OF ANTENNA PORT 3 AT FOUR LOCATIONS  
WITH VERTICAL PLANE GROUND**



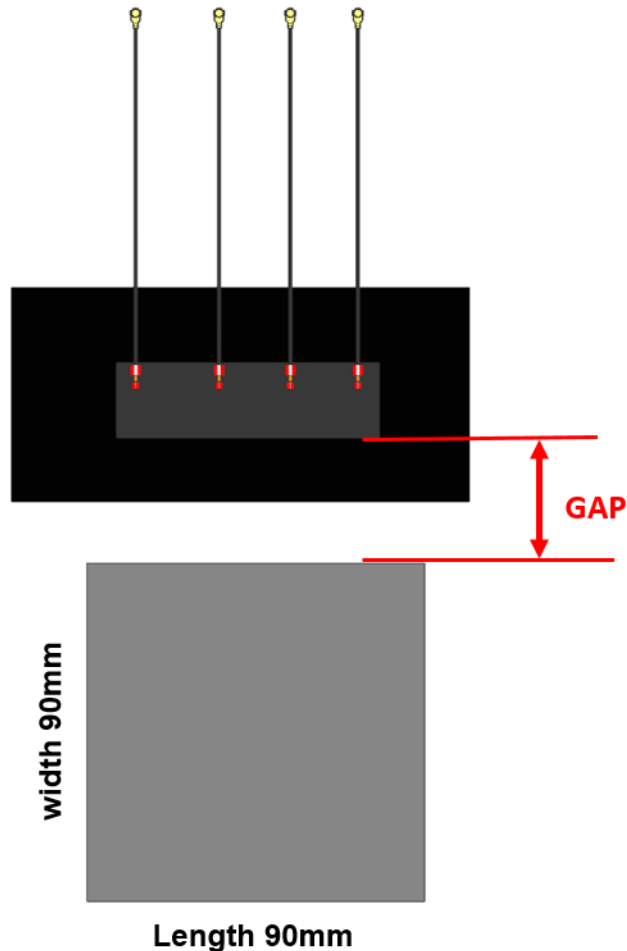
**FIGURE 6.2.8 EFFICIENCY OF ANTENNA PORT 4 AT FOUR LOCATIONS  
WITH VERTICAL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>54 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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## 6.3 ANTENNA RF PERFORMANCE AS A FUNCTION OF DIFFERENT DISTANCES WITH PARALLEL PLANE GROUND

Four locations with the parallel plane ground have been evaluated and these locations are shown in figure 6.3.0. The plane ground size is 90mm\*90mm and we move the plane ground to four locations for each test. The distance between the antenna and the parallel plane ground affect the antenna performance slightly. We still suggest the minimum distance between the antenna and the plane ground is recommended to be 5mm.



**FIGURE 6.3.0 FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

Ground Size: 90mm\*90mm;

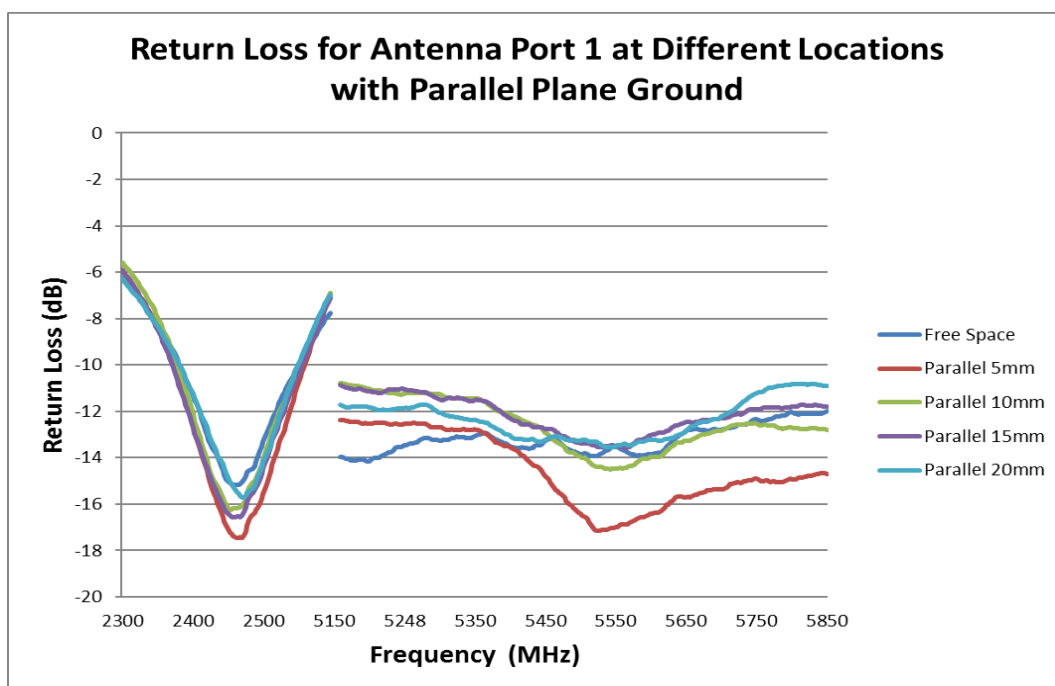
Location 1: Distance between antenna and plane (GAP) ground is about 5mm;

Location 2: Distance between antenna and plane (GAP) ground is about 10mm;

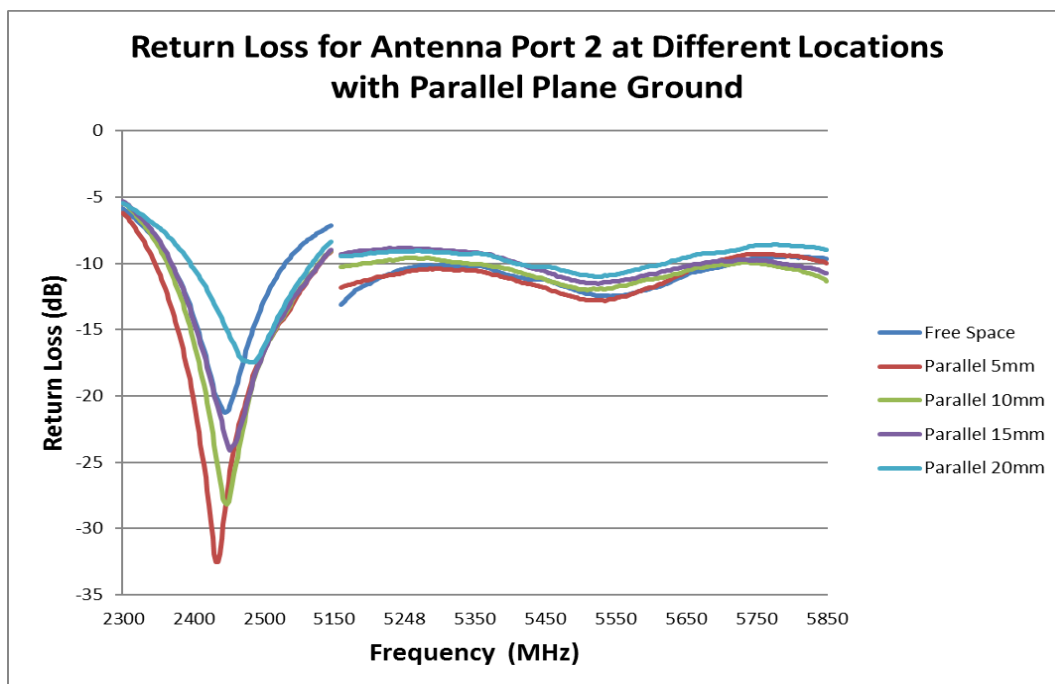
Location 3: Distance between antenna and plane (GAP) ground is about 15mm;

Location 4: Distance between antenna and plane (GAP) ground is about 20mm.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
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DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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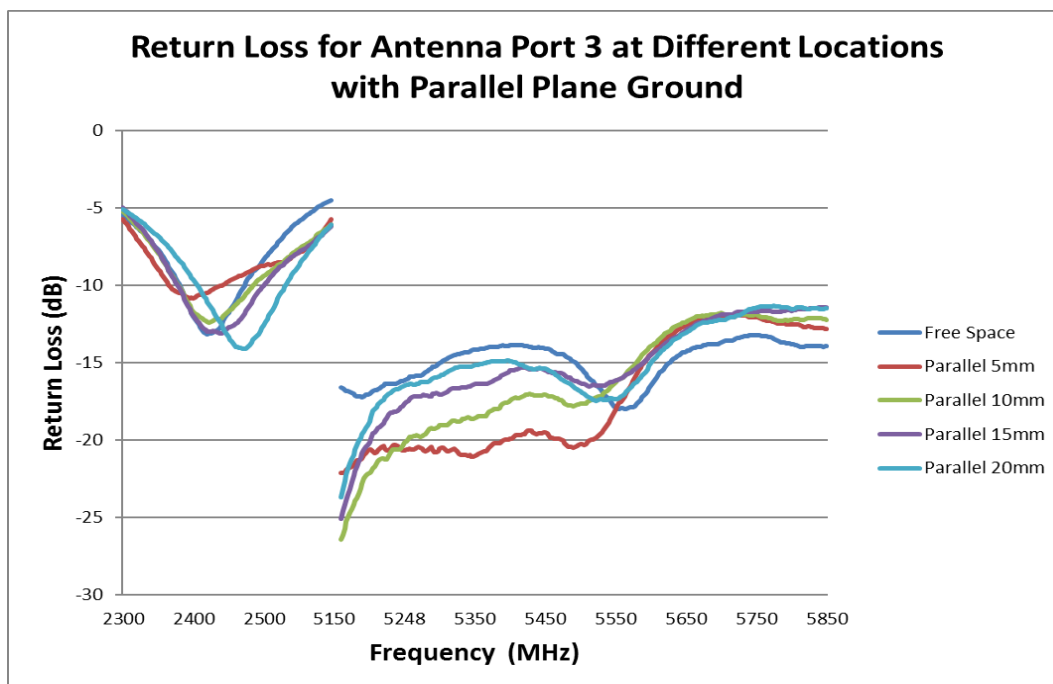


**FIGURE 6.3.1 RETURN LOSS OF ANTENNA PORT 1 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

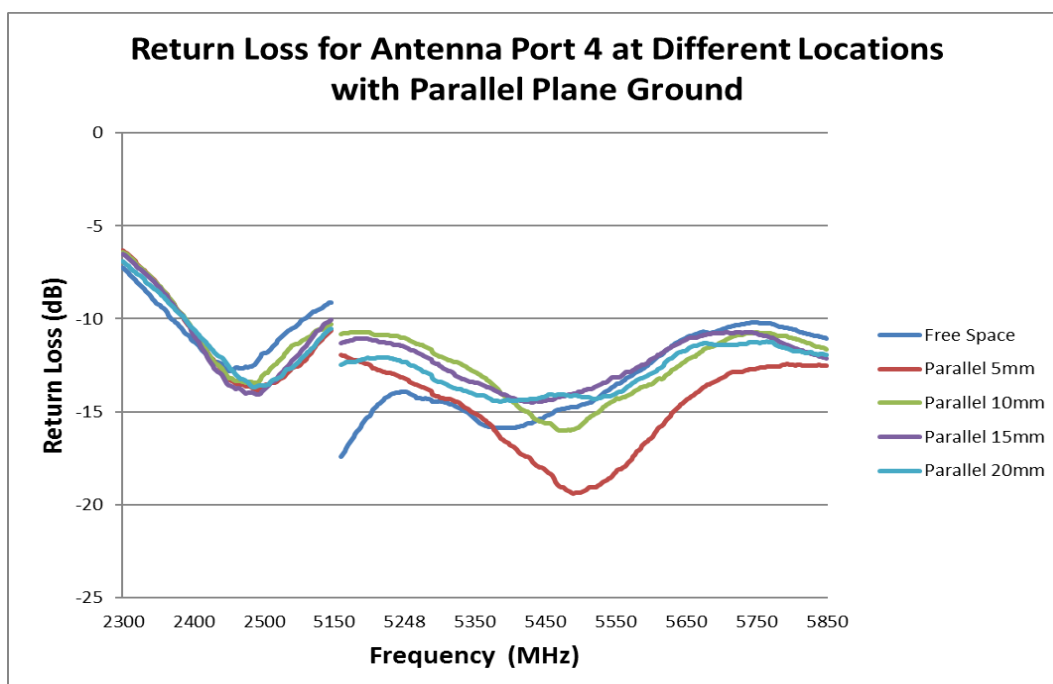


**FIGURE 6.3.2 RETURN LOSS OF ANTENNA PORT 2 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>56 of 65</b>
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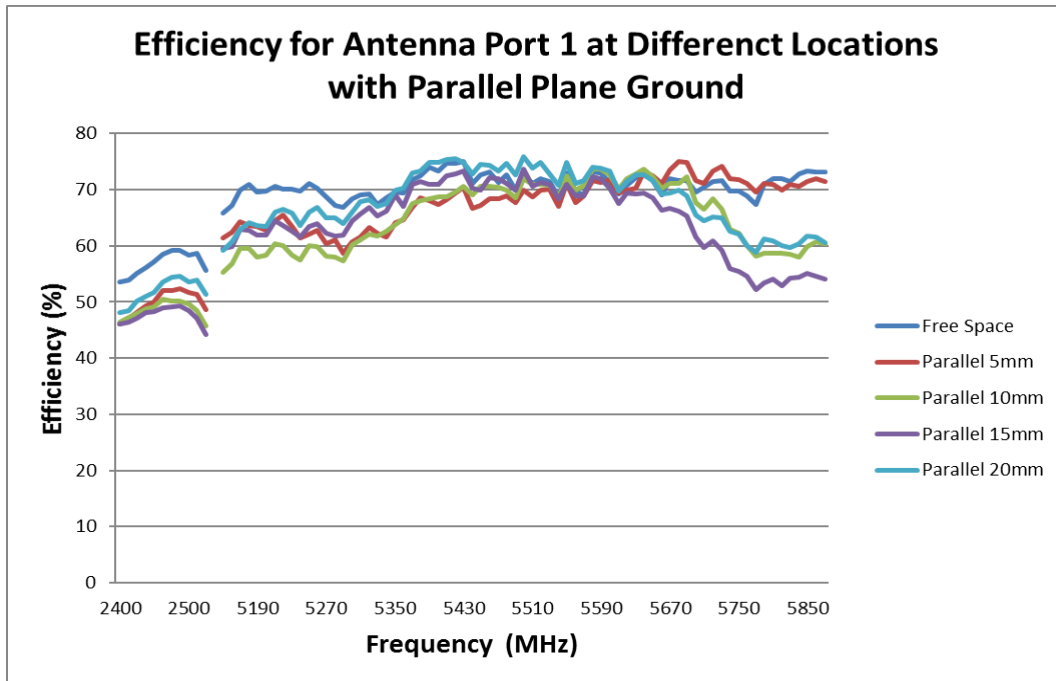


**FIGURE 6.3.3 RETURN LOSS OF ANTENNA PORT 3 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

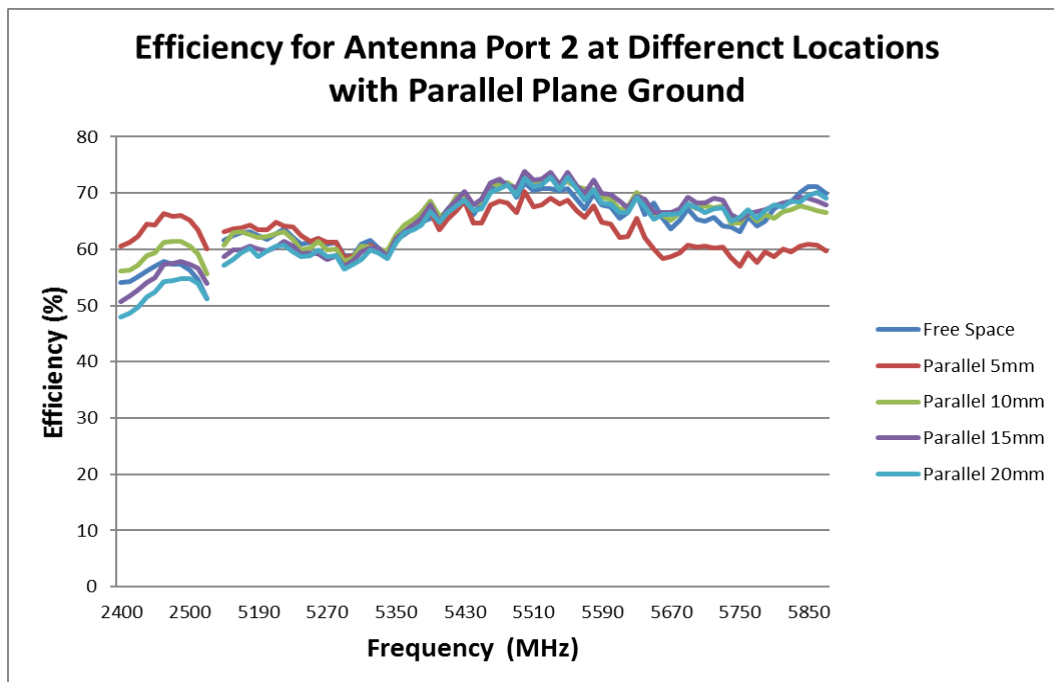


**FIGURE 6.3.4 RETURN LOSS OF ANTENNA PORT 4 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>57 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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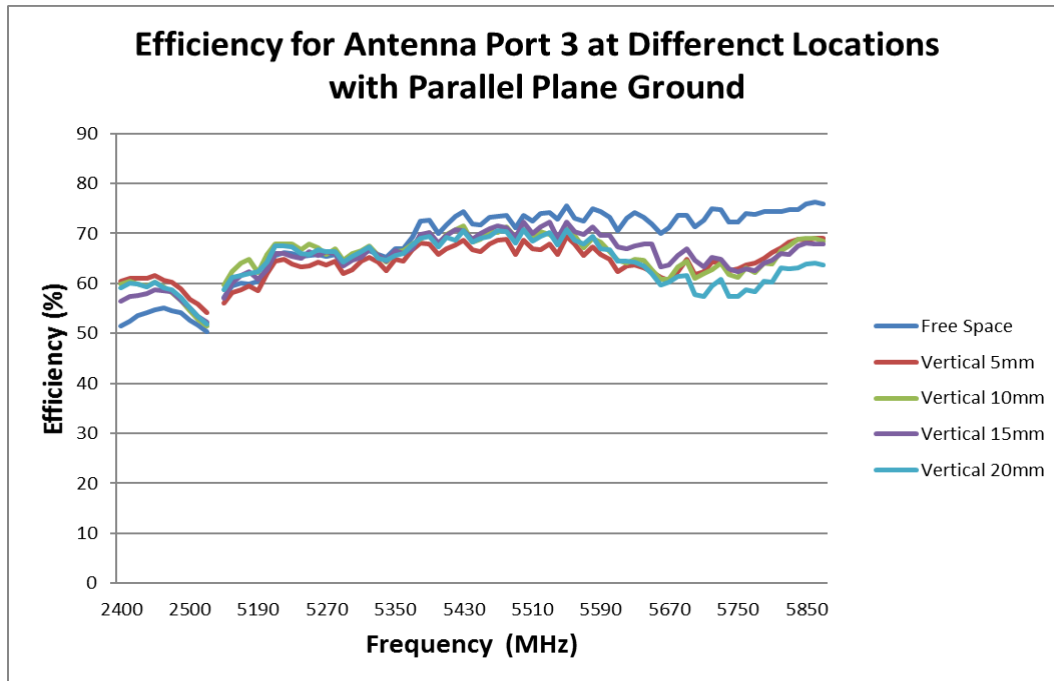


**FIGURE 6.3.5 EFFICIENCY OF ANTENNA PORT 1 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

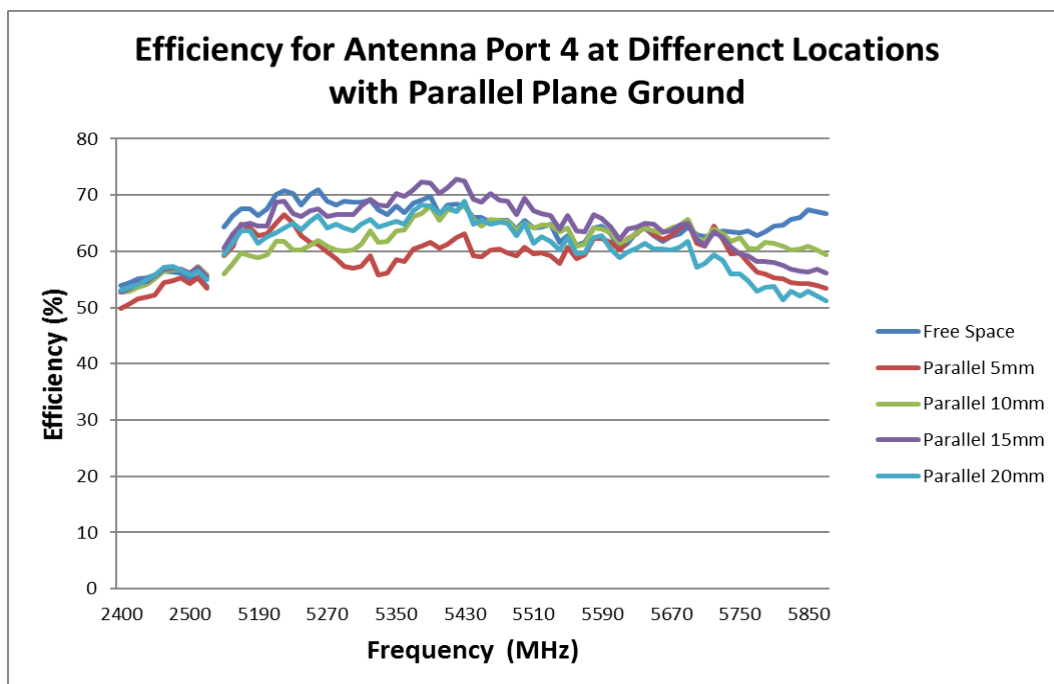


**FIGURE 6.3.6 EFFICIENCY OF ANTENNA PORT 2 AT FOUR LOCATIONS WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>58 of 65</b>
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**FIGURE 6.3.7 EFFICIENCY OF ANTENNA PORT 3 AT FOUR LOCATIONS  
WITH PARALLEL PLANE GROUND**



**FIGURE 6.3.8 EFFICIENCY OF ANTENNA PORT 4 AT FOUR LOCATIONS  
WITH PARALLEL PLANE GROUND**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>59 of 65</b>
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## 6.4 ANTENNA RF PERFORMANCE WITH DIFFERENT CABLE LENGTH

Six cable length have been evaluated and these states are shown in figure 6.4.0. The cable length is 50mm, 100mm (reference metal), 150mm, 200mm, 250mm and 300mm. The antenna performance with different cable length are shown in figure 6.4.1~6.4.8. When the length of cable is greater than 200 mm or less than 50 mm, the performance of low frequency will decrease obviously. We suggest the cable length is 100mm, 150mm and 200mm.

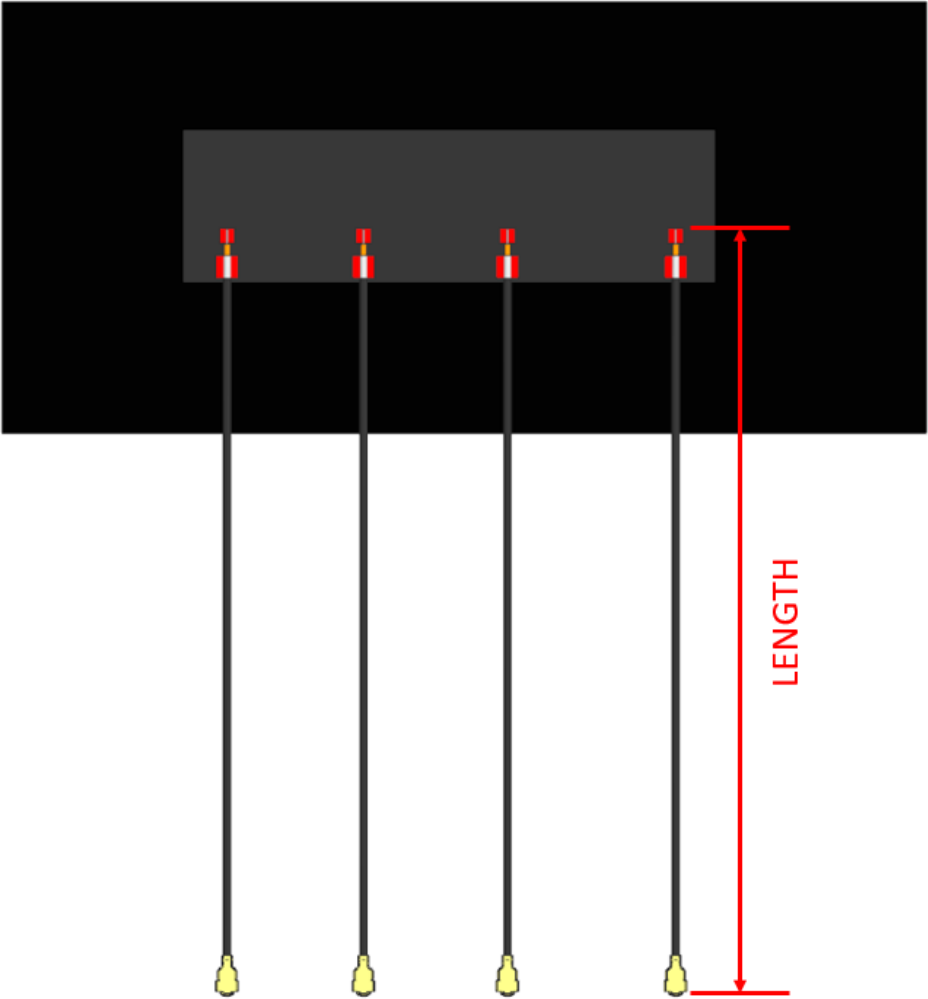


FIGURE 6.4.0 DIFFERENT CABLE LENGTH

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>60 of 65</b>
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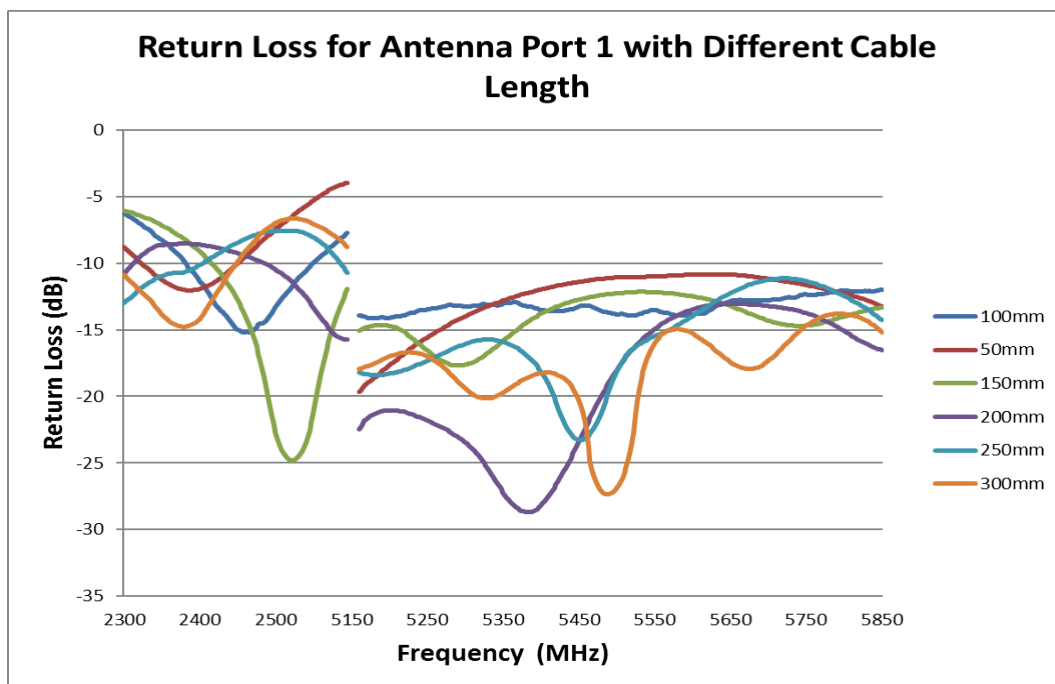


FIGURE 6.4.1 RETURN LOSS OF ANTENNA PORT 1 WITH DIFFERENT CABLE LENGTH

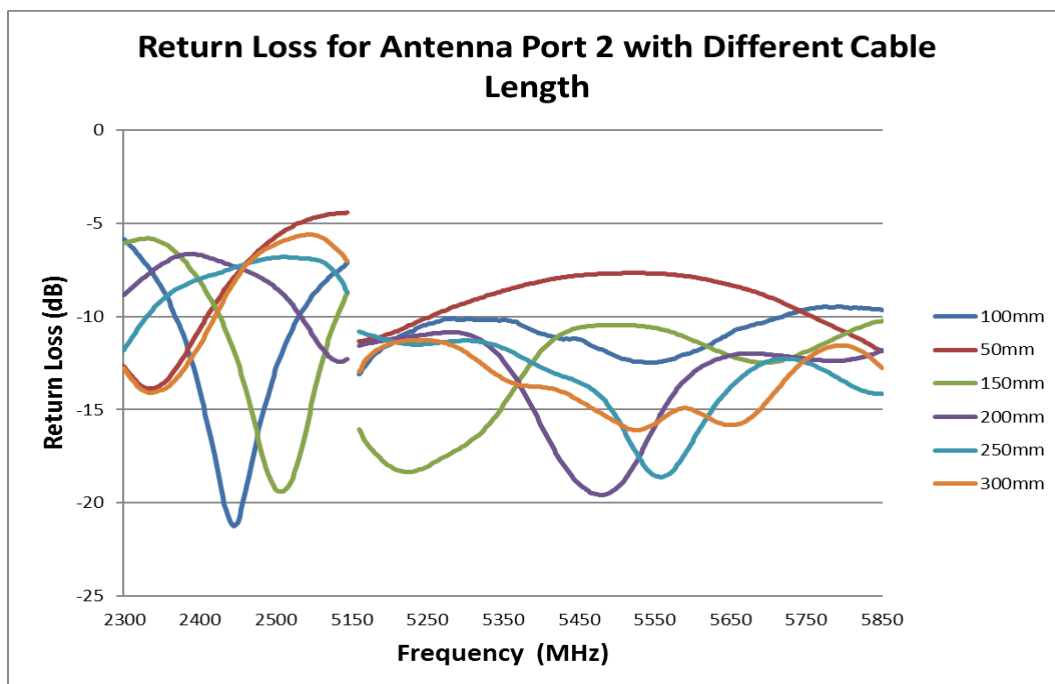


FIGURE 6.4.2 RETURN LOSS OF ANTENNA PORT 2 WITH DIFFERENT CABLE LENGTH

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>61 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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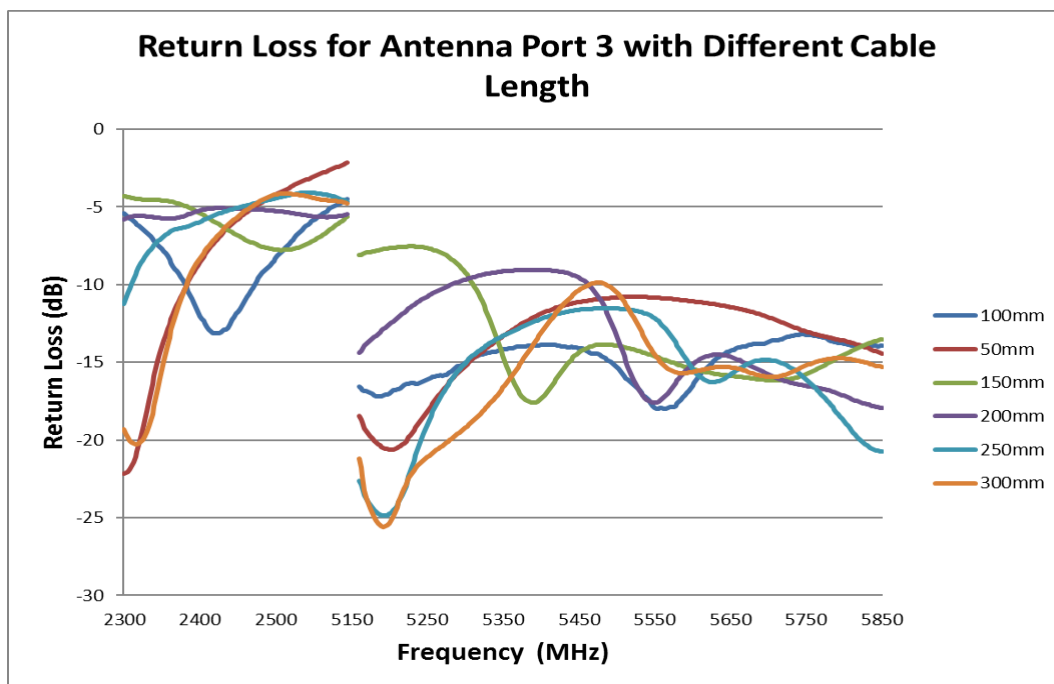


FIGURE 6.4.3 RETURN LOSS OF ANTENNA PORT 3 WITH DIFFERENT CABLE LENGTH

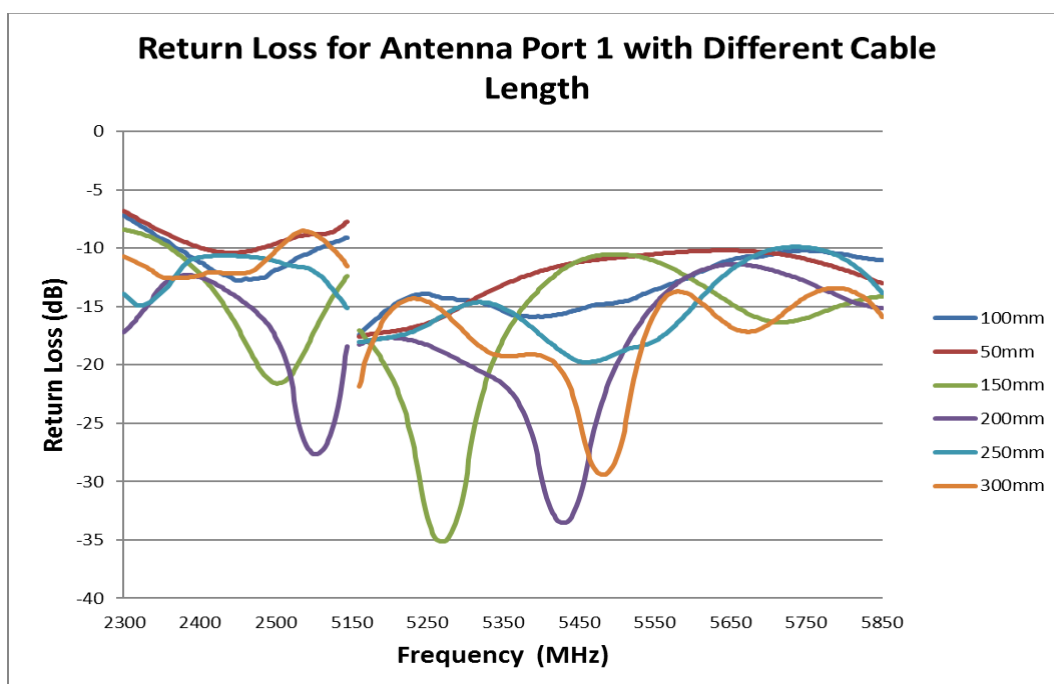
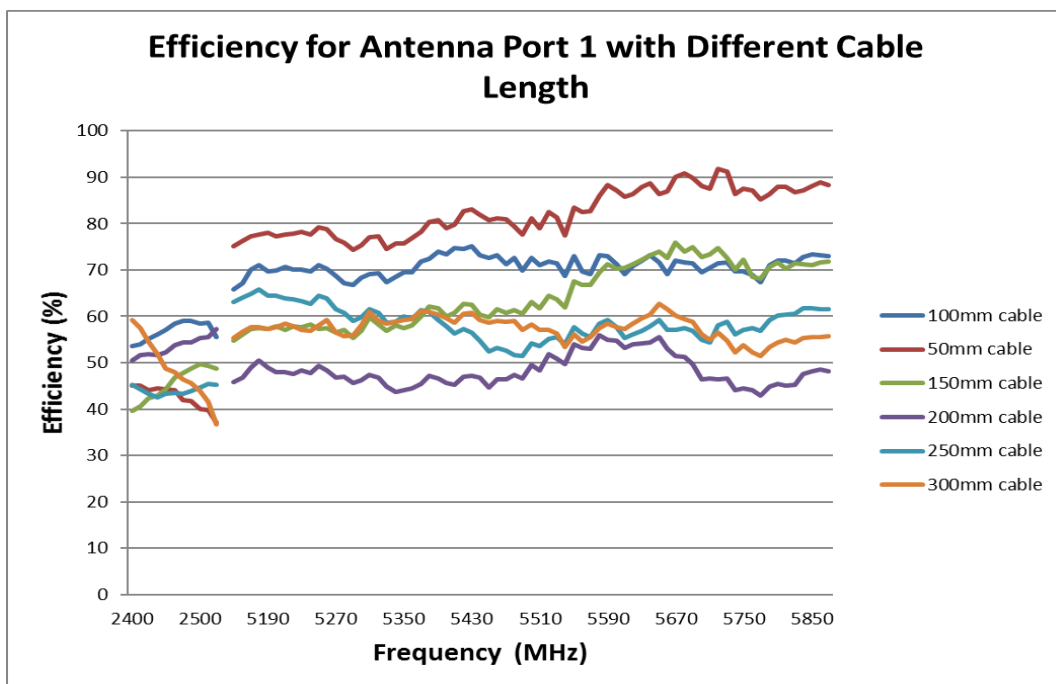


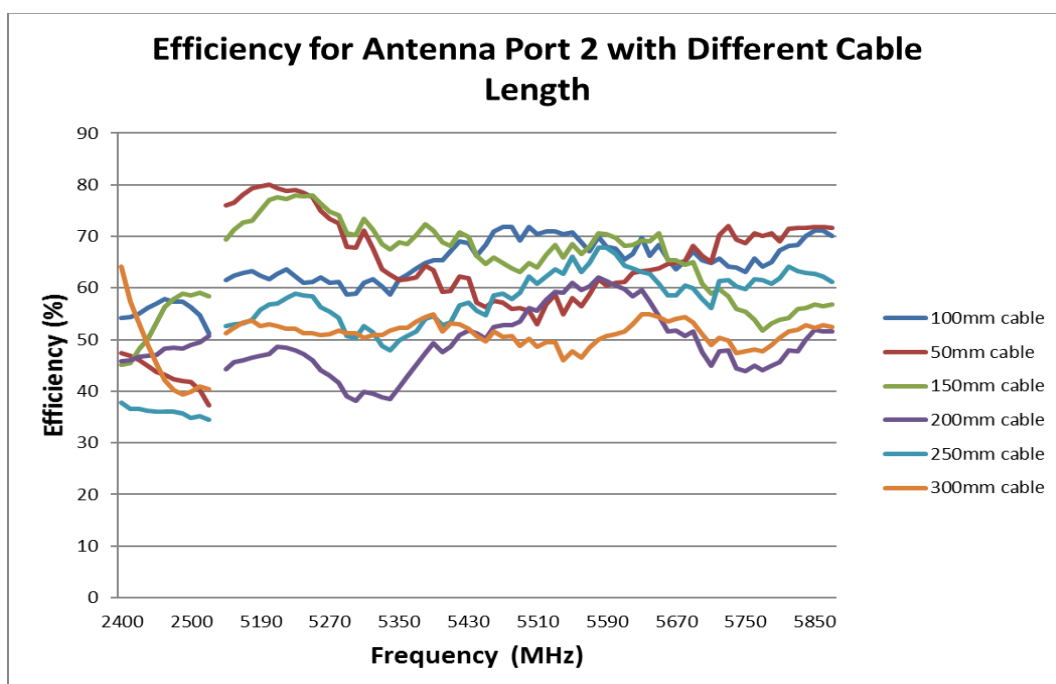
FIGURE 6.4.4 RETURN LOSS OF ANTENNA PORT 4 WITH DIFFERENT CABLE LENGTH

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>62 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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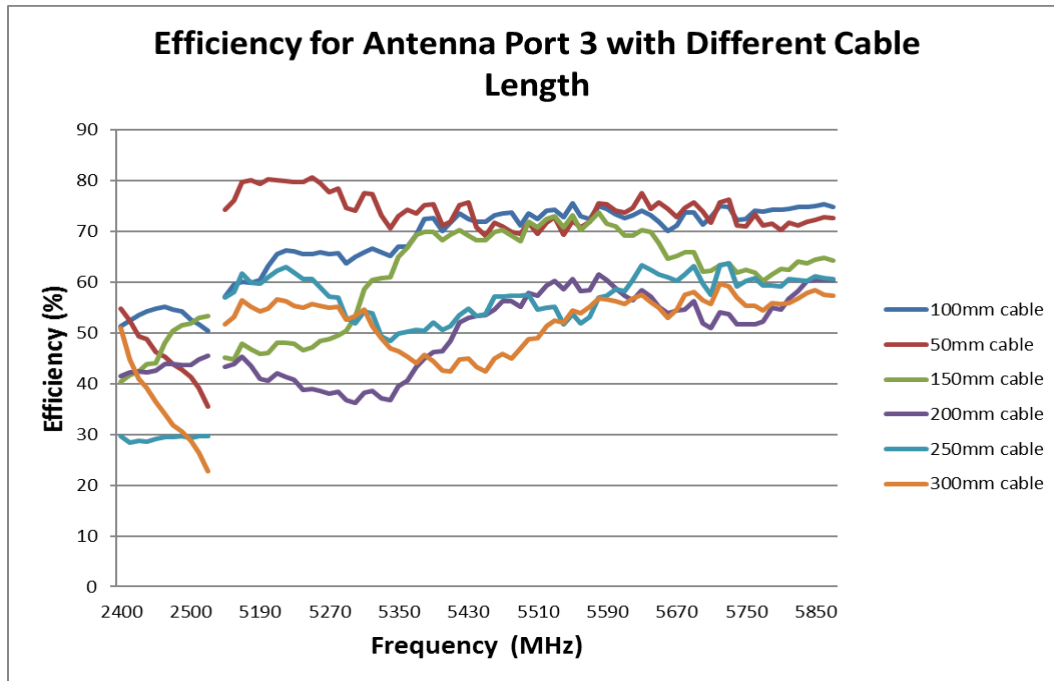


**FIGURE 6.4.5 EFFICIENCY OF ANTENNA PORT 1 WITH DIFFERENT CABLE LENGTH**

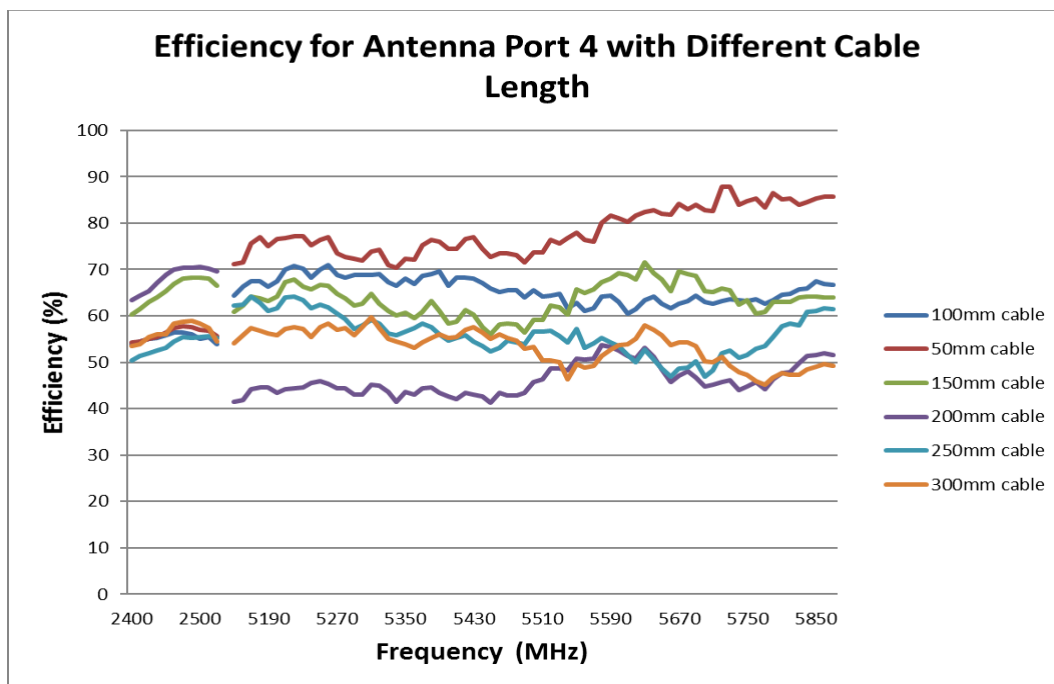


**FIGURE 6.4.6 EFFICIENCY OF ANTENNA PORT 2 WITH DIFFERENT CABLE LENGTH**

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
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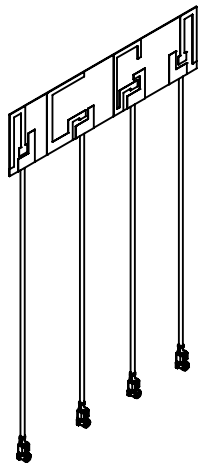


**FIGURE 6.4.7 EFFICIENCY OF ANTENNA PORT 3 WITH DIFFERENT CABLE LENGTH**

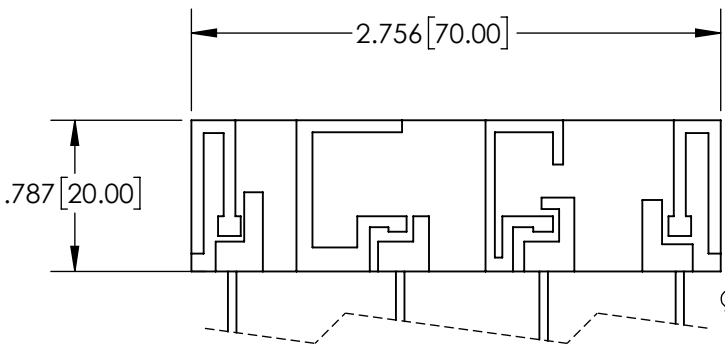


**FIGURE 6.4.8 EFFICIENCY OF ANTENNA PORT 4 WITH DIFFERENT CABLE LENGTH**

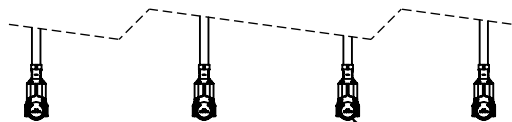
REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>64 of 65</b>
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SOLDER MASK  
PATTERN Cu  
(0.036mm THICK)  
BASE PI  
ADHESIVE (3M 9077)  
RELEASE PAPER  
STACK UP

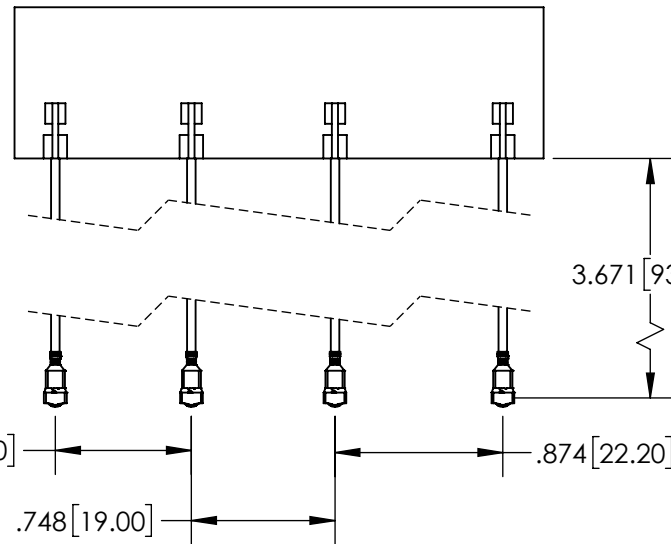


Ø.044 [1.12]



CONNECTOR: OD1.13 RF 2.5H U.FL  
(GOLD PLATED)

.079 [2.00]  
MAX WITH SOLDER PASTE  
(FLEX INCLUDED)



#### NOTES:

- 1) SOLDER MASK: BLACK
- 2) FOR PULL TEST, CAN NOT LIFT UP IN THE VERTICAL DIRECTION.
- 3) THE CONNECTOR WILL BE PROTECTED WITH A CAP

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**TOLERANCES:**  
FRACTIONAL  $\pm 1/32$   
ANGULAR: MACH  $\pm 0.5^\circ$  BEND  $\pm 90^\circ$

X.XX  $\pm 0.01$  [0.3]  
X.XXX  $\pm 0.005$  [0.13]  
X.XXXX  $\pm 0.0005$  [0.013]

INTERPRET GEOMETRIC TOLERANCING PER:  
**ANSI Y14.5M-1994**

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P: 1-213-985-1771 | W: VIVID-HOSTING.NET

MATERIAL  
NA

FINISH  
NA

DO NOT SCALE DRAWING

DESCRIPTION  
**2.4/5GHZ MIMO 4X4 FLEXIBLE  
ANTENNA**

PART NUMBER  
**212330-9100**

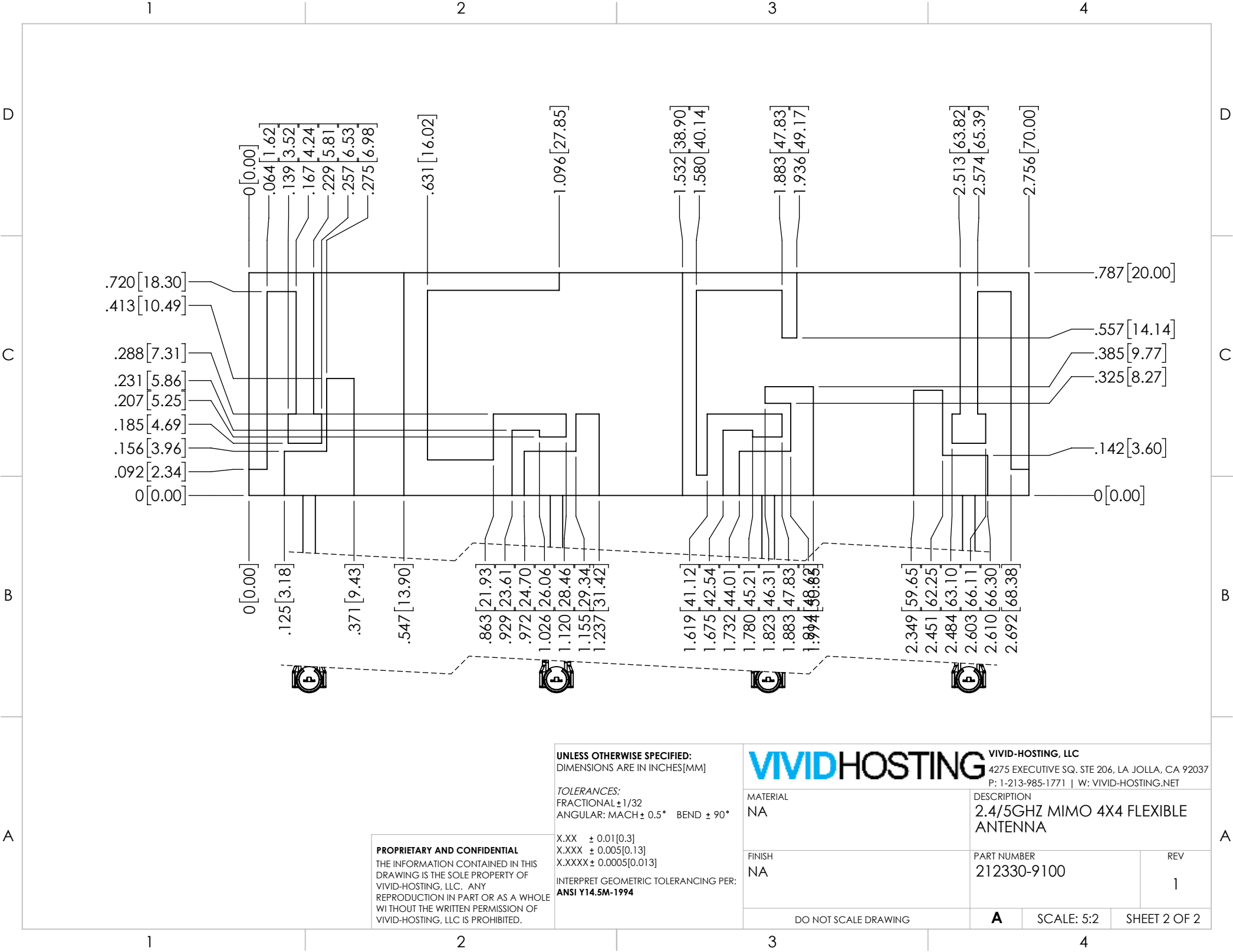
REV  
**1**

**A**

SCALE: 1:1

SHEET 1 OF 2

REVISIONS				
REV.	DESCRIPTION	DATE	CHANGED BY	APPROVED BY
1	INITIAL RELEASE	1/10/2024	J.JACK	K.CHAU



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**TOLERANCES:**  
FRACTIONAL  $\pm 1/32$   
ANGULAR: MACH  $\pm 0.5^\circ$  BEND  $\pm 90^\circ$

X.XX  $\pm 0.01$ [0.3]  
X.XXX  $\pm 0.005$ [0.13]  
X.XXXX  $\pm 0.0005$ [0.013]

INTERPRET GEOMETRIC TOLERANCING PER:  
**ANSI Y14.5M-1994**

**VIVIDHOSTING**

**VIVID-HOSTING, LLC**  
4275 EXECUTIVE SQ. STE 206, LA JOLLA, CA 92037  
P: 1-213-985-1771 | W: VIVID-HOSTING.NET

MATERIAL  
NA

FINISH  
NA

DESCRIPTION  
2.4/5GHZ MIMO 4X4 FLEXIBLE ANTENNA

PART NUMBER  
212330-9100

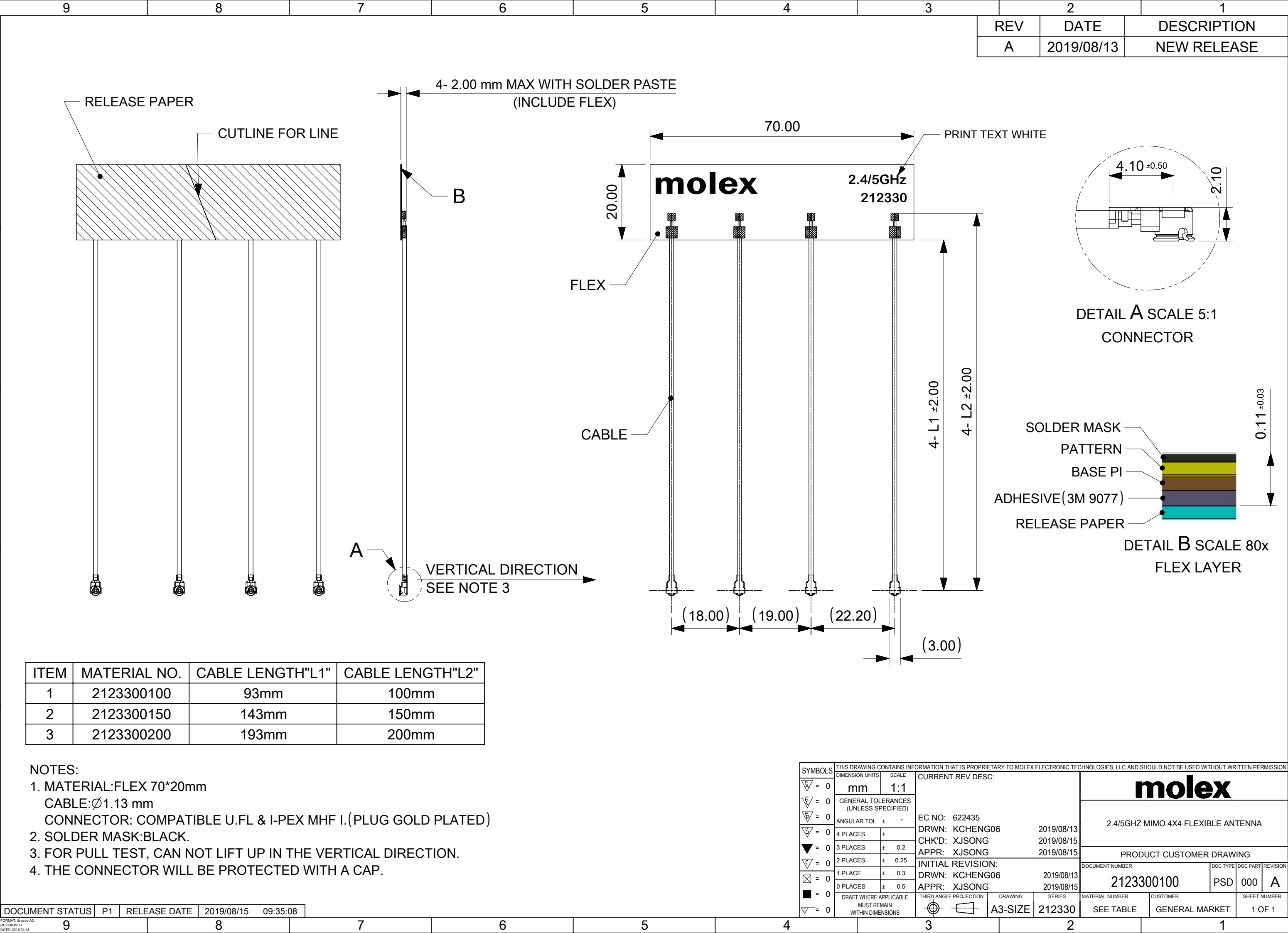
REV  
1

DO NOT SCALE DRAWING

**A**

SCALE: 5:2

SHEET 2 OF 2





# APPLICATION SPECIFICATION

## 7.0 CHANGE HISTORY

REV	DATA	DESCRIPTION
A	2019/08/13	First Release
B	2020/07/07	Update 2D/3D radiation pattern and add 6-7.125GHz band

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
<b>B</b>	EC No: 642299 DATE: 2020/07/15	<b>WiFi 6E Flex Cabled 4x4 MIMO Antenna Application Specification</b>	<b>65 of 65</b>
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
<b>AS-2123300100</b>	Liu Hai 2020/07/07	Kang Cheng 2020/07/07	Andy Zhang 2020/07/07